

## CLAIMS

What is claimed is:

- 1           1. A device comprising:  
2           a substrate, further including:  
3                 a first major surface including a plurality of lands; and  
4                 a second major surface;  
5           at least one component attached to at least some of the plurality of lands on  
6           the first major surface, the at least one spacer having a first height with respect to  
7           the first major surface; and  
8           at least one sacrificial component attached to the first major surface, the at  
9           least one sacrificial component having a second height with respect to the first  
10          major surface, the second height greater than the first height, the at least one  
11          sacrificial component further including a fuse.
- 1           2. The device of claim 1 wherein at least one sacrificial component includes  
2           at least one solder contact.
- 1           3. The device of claim 1 wherein at least one sacrificial component includes  
2           at least two solder contacts.
- 1           4. The device of claim 3 wherein the fuse is positioned between the at least  
1           two solder contacts.
- 1           5. The device of claim 3 wherein the sacrificial component further  
2           comprises a body, the body further comprising:  
3                 a first body surface that includes the at least two solder contacts of the  
4                 sacrificial component;  
5                 a second body surface substantially parallel with the first body surface  
6                 devoid of a conductor.

1           6. The device of claim 1 wherein the device includes a semiconductor.

1           7. The device of claim 1 wherein the device includes a ball grid array  
2 semiconductor device.

1           8. The device of claim 1 wherein the at least one sacrificial component  
2 further comprises:  
3           a body; and  
4           a C-shaped conductor including a portion of which is embedded within the  
5 body.

1           9. The device of claim 8 wherein the C-shaped conductor includes a fuse,  
2 wherein the fuse is molded within the at least one body of the sacrificial component.

1           10. The device of claim 8 wherein the body is an insulative material.

1           11. An assembly comprising:  
2 a ball grid array device, further including:  
3           a first major surface including an array of lands;  
4           a second major surface; and  
5           an array of solder balls attached to a first portion of the array of  
6 lands;  
7           at least one discrete component attached to a second portion of the  
8 array of lands; and  
9           at least one sacrificial component attached to a third portion of the  
10 array of lands, the sacrificial component having a fuse therein.

1           12. The assembly of claim 11 wherein the at least one discrete component  
2 has a first height, and the at least one sacrificial component has a second height  
3 greater than the first height.

1           13. The assembly of claim 11 wherein the at least one non sacrificial  
2 component is positioned to prevent the at least one discrete component from  
3 impacting another surface.

1           14. The assembly of claim 11 further comprising a printed circuit board,  
2 wherein the ball grid array device is attached to the printed circuit board, the at least  
3 one sacrificial component is positioned with respect to the printed circuit board to  
4 prevent the at least one discrete component from contacting the printed circuit  
5 board.

1           15. The assembly of claim 11 further comprising a printed circuit board,  
2 wherein the ball grid array device is attached to the printed circuit board, the printed  
3 circuit board further comprising:  
4           a ground plane; and  
5           a power plane,  
6 wherein the at least one non operational, sacrificial component is formed of an  
7 insulative material and positioned with respect to the printed circuit board to prevent  
8 the at least one discrete component from contacting the ground plane and the power  
9 plane of the printed circuit board.

1           16. The assembly of claim 11 wherein the sacrificial component has a  
2 surface positioned near the printed circuit board that is devoid of electrically  
3 conductive material.

1           17. The assembly of claim 11 wherein the sacrificial component further  
2 comprises:  
3           a body;  
4           a conductor molded within the body, the conductor formed to present two  
5 contacts at a first body surface for attaching the contacts to a corresponding set of  
6 lands on the ball grid array device, the conductor molded within the body so that the

7 body includes a second body surface positioned near the printed circuit board that is  
8 devoid of electrically conductive material.

1 18. The assembly of claim 17 wherein the conductor is C-shaped, each of  
2 the free ends of the C-shaped conductor completed to one of two contacts.

1 19. The device of claim 17 wherein the conductor includes a fuse.

1 20. The device of claim 17 wherein the conductor includes a fuse, and  
2 wherein the fuse is molded within the body of the sacrificial component.

1 21. An assembly comprising:  
2 a ball grid array device, further including:  
3 a first major surface including an array of lands;  
4 a second major surface; and  
5 an array of solder balls attached to a first portion of the array of  
6 lands;  
7 at least one discrete component attached to a second portion of the array of  
8 lands; and  
9 a plurality of non operational, sacrificial components attached to a third  
10 portion of the array of lands.

1 22. The assembly of claim 21 wherein the plurality of non operational,  
2 sacrificial components attached to a third portion of the array of lands includes at  
3 least three non operational, sacrificial components.

1 23. The assembly of claim 22 wherein the plurality of non operational,  
2 sacrificial components attached to a third portion of the array of lands pads have  
3 substantially the same height.

1           24. The assembly of claim 22 wherein the least one discrete component has  
2 a first height, and the plurality of non operational, sacrificial components attached to  
3 a third portion of the array of lands pads have a second height that is greater than the  
4 first height.

1           25. The assembly of claim 21 wherein the plurality of non operational,  
2 sacrificial components attached to a third portion of the array of lands each have a  
3 surface positioned away from the array of lands to which the plurality of sacrificial  
4 components are attached which is devoid of a conductive material.

1           26. The assembly of claim 21 wherein the plurality of non operational,  
2 sacrificial components attached to a third portion of the array of lands include a  
3 fuse.

1           27. The assembly of claim 21 further comprising a printed circuit board, the  
2 ball grid array assembly attached to the printed circuit board.

1           28. A method comprising:  
2 electrically connecting at least one discrete component to a land side of a  
3 substrate;  
4 forming solder balls on the land side of a substrate; and  
5 attaching at least one non operational, sacrificial component to the land side  
6 of the substrate.

1           29. The method of claim 28 wherein attaching the at least one non  
2 operations sacrificial component to the land side of the substrate includes placing  
3 the non operational, sacrificial component so as to prevent the discrete component  
4 electrically connected to the land side of the substrate from contacting another  
5 surface.

1           30. The method of claim 28 further comprising providing a fuse within the  
2 non operational, sacrificial component.

1           31. The method of claim 30 further comprising molding material around a  
2 fuse.